Department of Toxic Substances Control

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April 11, 2005

Mr. Matthew F. Letany, Director
Environmental, Safety & Health
Wyle Laboratories
128 Maryland Street
El Segundo, California 90245-4115

DRAFT REMOVAL ACTION WORKPLAN FOR GROUNDWATER AT THE NORTHWEST AREA, WYLE LABORATORIES, NORCO, CALIFORNIA

Dear Mr. Letany:

The Department of Toxic Substances Control (DTSC) has reviewed the Draft Removal Action Workplan (RAW), submitted by Environ, dated March 1, 2005 and received on March 2, 2005. The RAW presents background information, identifies and evaluates removal action alternatives and proposes a removal action for contaminated groundwater near the northwest boundary of the Site.

Based on its review, DTSC has identified discrepancies in the RAW that require clarification and/or modification. Enclosed is a set of comments from DTSC's project team identifying these discrepancies. Please revise the RAW according to enclosed comments and submit the revised document by April 21, 2005.

If you have any questions, please contact Mr. Juan Osornio, Project Manager, at (714) 484-5498 or me at (714) 484-5368.

Sincerely,

Shahir Haddad, P.E.
Unit Chief
Cypress Branch
School Property Evaluation and Cleanup Division

Enclosure

cc: See next page

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DTSC COMMENTS
DRAFT REMOVAL ACTION WORKPLAN FOR GROUNDWATER AT THE NORTHWEST AREA WYLE LABORATORIES NORCO, CALIFORNIA

The following DTSC staff reviewed and provided comments herein to the Draft Removal Action Workplan (RAW). Original comments from the Human and Ecological Risk Division and Geological Services Unit (GSU) are available for review in DTSC project files.

Juan Osornio
Project Manager
Schools Unit-Cypress Office

1. Page E-2, Executive Summary

   "The recommended removal action is RA-5 – In Situ Chemical Oxidation by injection of sodium and/or potassium permanganate solution."

   A pilot/bench-scale test is required to evaluate whether permanganate injection is a viable remedial alternative in the RAW that will meet the RAOs, and be able to remove target contaminants such as VOCs in a timely and protective manner. DTSC requires implementation of a proven technology for an interim remedial measure.

   Modify the RAW as necessary.

2. Page 13, Section 3.2, Extent and Volume of Ground Water Contaminants

   - For all hazardous constituents detected in soil gas and groundwater, include in the RAW Iso-concentration maps.
   - Explain how Wyle related hazardous constituents not addressed by this RAW will be evaluated/cleaned up, if necessary. All Wyle related contaminants migrating off-site should be addressed in the RAW.

   Modify the RAW as necessary

3. Page 15, Section 3.5, Additional Site Investigations

   - Clarify whether previous groundwater and soil gas investigations defined nature and boundaries of contamination in offsite areas. If soil gas and groundwater in and around areas targeted by this RAW is not completely characterized, then an explanation is required on how the objectives of the RAW will be achieved.
   - Evaluate the potential for presence of LNAPL or DNAPL at the site. Describe the effect of LNAPL/DNAPL, if warranted, on the proposed removal alternatives.

Modify the RAW as necessary.

4. Page 16, Section 4.1, Removal Action Objectives/Goals

"As previously mentioned, this RAW will focus on remediation of VOC impacted groundwater..."

- Indicate that this removal is an interim measure.
- All site hazardous constituents migrating off-site in ground water and soil gas should be addressed, not only VOCs.
- An additional RAO should be included to reflect that one of the RAW objectives is to prevent further migration of on-site contaminants to off-site areas.

Modify the RAW as necessary.

5. Page 23, Section 4.4, Interim Cleanup Goals

".....the process used in developing the interim cleanup goal for ground water..."

- This section should specify the criteria for termination of RAW activities.

Modify the RAW as necessary.

6. Page 27, Section 5.1, Identification and Preliminary Screening of Removal Action Alternatives

For Alternatives 2 through 5, include the following information:

- Rationale for the number, location and spacing of wells and the number of treatment units, where applicable.
- Figure to show the alternative on a site layout.
- Figure to show the design of the wells.
- Include evaluation of the applicability of the technology to Wyle using existing information.
- Explain how migration of and/or potential exposure to site hazardous constituents not mitigated by the alternative will be addressed.

Modify the RAW accordingly.

7. Page 30, In-Situ Enhanced reduction by HRC:

   "...use of HRC ... biodegradation of VOCs may be encouraged..."

   Include site-specific information (From onsite F-area) to demonstrate effectiveness and timeliness of such technology.

   Modify the RAW as necessary.

8. Page 31, RA-5-In Situ Chemical Oxidation by Sodium and/or Potassium Permanganate.

   This alternative does not include a pilot bench scale test similar to RA-4. Such test will be required for its consideration as a potential removal alternative. This was not factored into the schedule.

   Since the primary objective of the RAW is to address potential exposure to residents in an expeditious manner, in-situ bioremediation should be screened out for the following reasons:

   1. Pilot study is required to assess effectiveness, implementability, applicability and timeliness at Wyle.
   2. Uncertainty regarding whether RAW objectives can be achieved by this technology.
   3. It is extremely unlikely that removal objectives would be achieved in a timely manner.
   4. A final remedial action may be in place prior to determining whether this technology is effective in removing VOCs and RAW objectives can be met. The goal of this interim removal is to prevent any current exposure to residents from Wyle-related contaminants.

   Clarify and/or modify the RAW as necessary.

9. Page 32, Section 5.2.3, Cost

   "The cost for the RAW is developed for 12 months...."

   For developing the RAW Cost estimates, DTSC recommends the use of U.S EPA " Guide to Developing and documenting Cost Estimates During the Feasibility Study" , EPA 540-R00-002, July 2000.

Modify the RAW as necessary.

10. Page 33, Section 5.3.1.2, RA-1: Implementability

"...the criterion of technical and.....would not apply"

This alternative can be easily implemented and would score best on the implementation criteria.

Modify the RAW as necessary.

11. Page 34, Section 5.3.2.1, RA-2- Effectiveness

"...monitoring would be conducted from appropriate wells at the Northwest Area..."

- Natural attenuation monitoring should be conducted according to DTSC and U.S EPA guidelines.
- For alternatives with natural attenuation component, specify the natural attenuation parameters that will be used and describe how natural attenuation progress will be evaluated.

Modify the RAW as necessary.

12. Page 35, Section 5.3.3.1, RA-3-Effectiveness

"...RA-3 would reduce the concentration of VOCs..."

- Clarify why other site hazardous constituents are not addressed in this RAW.
- Clarify whether this technology is effective for treating water contaminated with perchlorate and NDMA by reference, state/federal guidance and/or sites where this technology was successfully utilized.

13. Page 37, Section 5.3.5.1, RA-5: Effectiveness

"Under RA-5... will provide for a fast and efficient removal response..."

- Clarify how a determination was made that the technology "will provide fast and efficient removal" without any pilot and/or bench scale tests.

- Clarify the criteria that will be used to determine whether this alternative is achieving the RAW objectives. Discuss anticipated timeframe for achieving objective.
- Clarify how potential exposure to other site hazardous constituents (For example; private wells near Wyle property used for irrigation and/or dinking) would be addressed by this technology.
- Describe how permanganate injection progress will be evaluated. Specify evaluation criteria and evaluation parameters.

Modify the RAW as necessary.

14. Page 41, Section 6.2, Implementability, RA-3, High Vacuum 2-Phase Extraction and Treatment

    "Given the residential nature of the Northwest Area... placement and operation ... discharge ... will be major challenges."

    The installation of extraction wellheads to existing monitoring wells, and incorporating piping to the existing treatment system on-site would score well for implementability. Only one rating point was assigned to RA-3. DTSC believes at least three rating points should be assigned to RA-3, due to its ease of incorporation to existing equipment. Based on the comparative analysis, RA-3 appears to be the preferred/selected alternative. See comment below.

15. Page 43, Rating Summary and Recommended Alternative

    Comparison of alternatives should be conducted based on the National Contingency Plan nine evaluation criteria. Modify alternatives comparison table to reflect the NCP nine criteria. For each one of the NCP nine criteria, explain why an alternative is preferred against the others. Rank alternatives on a 1 to 5 ranking scale with 1 being the worst and 5 the best under each one of the nine criteria. Assign score equal to the Rank. Add scores for each alternative. The alternative with the highest score would be the preferred/selected alternative. Use attached table as a model in developing comparison table in the RAW. Include detailed explanation of the ranking under each criterion in this section.

    Modify the RAW as necessary.

Ron Okuda, R.G.
Staff Geologist
Geological Services Unit

1. The effectiveness of Monitored Natural Attenuation, In-Situ Enhanced Reduction by Hydrogen Release Compound (HRC), and In-Situ Oxidation by Injection of Sodium and/or Potassium Permanganate cannot be evaluated and are not appropriate at this time because of significant site characterization data gaps. The groundwater gradient, flow direction, and flow velocity have not been determined in the Northwest section of the Wyle Laboratories property or offsite in the residential neighborhood. The chemistry of the groundwater and saturated soil has not been studied to determine whether HRC or permanganate will react with other chemicals in the groundwater and be used up before reacting with the chlorinated aromatic hydrocarbons. The quantity and frequency of HRC or permanganate cannot be estimated without an understanding of the site-specific hydrology, groundwater chemistry, and concentration of the VOCs in the groundwater. Additionally, the placement of groundwater monitoring wells to evaluate the remedial alternatives cannot be optimally located if the groundwater flow direction is unknown.

2. The only remedial alternative evaluated in the RAW that has data to demonstrate site-specific effectiveness is the High Vacuum 2-Phase Extraction and Treatment. This system is operating in the central portion of the Wyle Laboratories site. The system can be installed on the Wyle Laboratories property initially using the two groundwater monitoring wells (MW-14 and MW-15) and/or installation of wells along the site boundary. Monitoring wells could be installed in Golden West Lane or residential properties to monitor the radius of influence of the groundwater extraction and, if needed, incorporated as additional extraction points. The existing soil gas probes and installation of additional soil gas probes can be used to monitor the response to the soil vapor extraction and measure changes in VOC concentrations in the vadose zone. As the effectiveness of the system is monitored and evaluated, additional extraction wells could be incorporated.

3. The RAW should have investigated other remedial alternatives such as installation of horizontal soil vapor extraction wells under the homes and street to intercept soil vapors from migrating into the homes. The horizontal

soil vapor extraction wells could originate from the Wyle Laboratories property and radiate outwards under the Golden West Lane and the residences.

4. The proposed remedial alternative RA-5, In-Situ Chemical Oxidation by Injection of Sodium and/or Potassium Permanganate should not be accepted because the site characterization data gaps prevents a reasonable evaluation of the effectiveness, cost, and time to remediate the VOCs to an acceptable level.

William Bosan, Ph.D.
Staff Toxicologist
Human and Ecological Risk Division

1. Page 13, Section 3.1 (Type, Source and Location of Contaminants): The last paragraph states that the RAW addresses potential risks associated with inhalation of VOCs in residences, assuming such VOCs partition from groundwater to soil gas. This is not an assumption but reality, as shown by the numerous co-located soil gas and groundwater samples along Golden West lane, Third Street and Hillside Avenue. Please delete the statement within the parentheses.

2. Page 14, Section 3.3 (Health Effects of Contaminants): The first paragraph states that ingestion and dermal contact of contaminated groundwater is considered a potential exposure concern. This sentence should be re-written to state that for the majority of residents in the Northwest Area, ingestion of and dermal contact with groundwater are not complete exposure pathways, with the exception of those few homes having private wells.

3. Page 16, Section 4.1 (Removal Action Objectives/Goals): For the second bullet, please delete "ambient outdoor air", as this pathway will not really be relevant to potential residential exposures.

4. Page 25, Section 4.4.5 (Fate and Transport Modeling): HERD used the DTSC-modified Johnson and Ettinger (J&E) Model, GW-SCREEN, Interim Final 12/04 (last modified 1/21/05) to validate the fate and transport modeling. The following average site physical parameters were used (from Appendix B):

   - Soil bulk density = 1.76 g/cm3
   - Total porosity = 0.366
   - Water-filled porosity = 0.27

Based on the screening J&E Model results for a depth of 10-feet, the groundwater-to-air transfer factors were about one-half the values presented in Table A6. As for all cleanup goals, HERD recommends a target risk of 1E-06. Based on this target risk and the above site-specific parameters, the following target groundwater concentrations were estimated:

Chemical of Concern	Target Risk	Groundwater Conc. (µg/L)
Benzene	1E-06	3.84E+01
PCE	1E-06	7.27E+01
TCE	1E-06	3.42E+02
Cis 1,2-DCE	Target Hazard of 1	2.59E+04

Please provide additional justification for the difference in J&E results and also provide the J&E Model outputs used to derive the results presented in Table A6 and the interim cleanup goals, including the DATAENTER, CHEMPROPS, INTERCALCS, and RESULTS pages.

Table A5 presents the modeling parameters used, which appear to be default parameters for the LS soil type, even though site-specific parameters were included in Appendix B. using the default LS soil physical parameters, the following target groundwater concentrations were estimated:

Chemical of Concern	Target Risk	Groundwater Conc. (µg/L)
Benzene	1E-06	1.83
PCE	1E-06	3.34
TCE	1E-06	1.59E+01
Cis 1,2-DCE	Target Hazard of 1	1.24E+03

Depending on the soil parameters used, the cleanup goals can vary by a factor of 20 or greater. Because of the variability of physical parameter data and the limited number of samples, groundwater cleanup goals should be based on the more conservative default parameters. Since permanent soil vapor probes are located in the Northwest Area, potential indoor impacts would be better estimated using soil gas data. Therefore, HERD recommends that soil gas results be used to verify remediation performance by comparison to the soil gas screening levels previously established for the Northwest Area. Please see HERD's comments on the IAQ technical memorandum, dated April 1, 2005.

5. Page 25, Section 4.4.6 (Risk-Based Target Concentrations): As discussed previously in Comment No.4, HERD recommends a target risk of 1E-06. Please revise the groundwater target concentrations consistent with the recommendations made in Comment No.4. Also, include soil gas target concentrations.

Conclusions

Several issues were identified that require revision, specifically 1) provide additional rationale for the differences in the J&E Model results and include the J&E Model Outputs for review; 2) revise groundwater target concentrations using default physical parameters and a target risk of 1E-06; 3) verify groundwater remediation performance using soil gas data collected from the permanent probes by comparing the data to previously established soil gas screening concentrations.

Amit Pathak, P.E
Hazardous Substances Engineer
Schools Unit-Cypress Office

1. Page 35, Section 5.3.3.1, RA-3-Effectiveness

   The MW 14 well that appears to have low recharge may be operated in a pulse mode (to recharge the well, if needed) to remove groundwater/vapor from the source area.

   The soil vapor extraction with additional extraction points at the northwest onsite/off site may also be carried out. Based on the information from the boring logs, the decomposed granite bedrock has been encountered 1.5 ft bgs to 20 ft bgs. The shallow soil above the bedrock can be characterized as silty sand. This indicates that the bedrock that is present at shallow depth can limit the soil vapor extraction. However, if vertical vapor extraction wells can be installed where the bedrock is deep, the SVE can be more effective.

   In order to avoid uncertainty associated with the bedrock, horizontal trenches (or horizontal soil vapor extraction wells) instead of vertical soil vapor extraction wells can also be evaluated. The shallow trenches (or horizontal wells) in the subsurface soil may be effective to extract the soil vapor to mitigate the in door air risk.

   The groundwater/soil gas treatment may include typical skid mounted above ground treatment such as carbon adsorption and thermal/catalytic oxidation.

Table 1

COMPARATIVE ANALYSIS OF ALTERNATIVES BASED ON NCP NINE CRITERIA
(1=least favorable, 5=most favorable)

	Alternatives	Overall protection of human Health and the Environment	Compliance with ARARs	Long-term effectiveness and permanence	Short term effectiveness	Reduction in toxicity, mobility or volume	Implementability	Cost	Regulatory Agency Acceptance	Community Acceptance[1]	Score
1	No Action	1	1	1	5	1	5	5	1	1	21
2	Monitored Natural Attenuation	2	2	2	4	2	4	4	2	2	24
3	High Vacuum 2-Phase Extraction	5	5	5	1	5	1	1	5	5	33
4	In-Situ Enhanced reduction by HRC	3	3	3	3	3	3	3	3	3	27
5	In-Situ Chemical Oxidation by Permanganate	4	4	4	2	4	2	2	4	4	30

[1] Scoring is based on anticipated community acceptance. This scoring may change based on public comments during the formal RAW comment period.